

Atty. Dkt. No. 10012851-2

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A pen maintenance system, comprising:
a pen mounted for reciprocal movement on a shaft in a chassis, the pen having a printhead and a chamber for holding ink;
a supply of ink in the chassis;
a sensor for monitoring changes in the amount of ink in the chamber; and
a pump in the chassis, said pump connectable to the chamber for changing a the pressure in the chamber;
wherein the pen is movable along the shaft to a position where said printhead aligns with said supply of ink and said pump is operable to selectively draw ink into the chamber through the printhead and expel ink from the chamber through the printhead.
2. (Original) The pen maintenance system of claim 1 including an ink supply reservoir separate from the pen.
3. (Original) The pen maintenance system of claim 1 wherein the pump is selectively placed in fluid communication with the chamber.
4. (Original) The pen maintenance system of claim 3 wherein the pump is for decreasing the pressure in the chamber.
5. (Original) The pen maintenance system of claim 3 wherein the pump is for increasing the pressure in the chamber.
6. (Currently Amended) A method for maintaining a pen, comprising the steps:
(a) mounting a pen having an ink chamber and a printhead for reciprocal movement along a shaft in a hardcopy device;

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(b) mounting a supply of ink in the hardcopy device;
(c) moving the pen to align it with the supply and connecting the pen to the supply;
(d) connecting a pump to the pen; and
(e) operating the pump to modify a the pressure in the chamber to thereby modify the amount of ink in the ink chamber by drawing ink into the chamber from the supply and through the printhead and expelling ink from the chamber through the printhead into the supply.

7. (Original) The method according to claim 6 including the step of detecting pressure in the ink chamber to generate a chamber pressure value, and comparing the chamber pressure value to a predetermined pressure value.

8. (Original) The method according to claim 7 wherein the step of detecting pressure in the ink chamber includes the step of providing a sensor in the ink chamber.

9. (Original) The method according to claim 7 wherein operation of the pump is initiated when the chamber pressure value differs from the predetermined pressure value by a predetermined value.

10. (Original) The method according to claim 6 including the step of detecting a fluid level in the ink chamber.

11. (Original) The method according to claim 10 wherein operation of the pump is initiated upon detection of a change in fluid level in the ink chamber.

12. (Original) The method according to claim 10 wherein the step of detecting the fluid level in the ink chamber includes the step of providing a fluid level sensor in the ink chamber .

13. (Original) The method according to claim 6 wherein operation of the pump causes ink to flow into the ink chamber from an ink source.

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14. (Original) The method according to claim 13 including the step of fluidly connecting the ink chamber to the ink source.

15. (Original) The method according to claim 13 wherein the pen includes nozzles and ink flows into the ink chamber through the nozzles.

16. (Original) The method according to claim 13 wherein the pump reduces pressure in the ink chamber to cause ink to flow into the ink chamber through the nozzles.

17. (Original) The method according to claim 16 wherein the pump operates until the internal pressure in the ink chamber reaches a predetermined value.

18. (Original) The method according to claim 6 wherein the pump changes the pressure in the ink chamber to cause ink to flow out of the ink chamber.

19. (Original) The method according to claim 8 wherein the pump increases the pressure in the ink chamber .

20. (Original) The method according to claim 8 wherein the pen includes nozzles and ink flows out of the ink chamber and through the nozzles.

21. (Original) The method according to claim 20 including the step of capturing the ink that flows through the nozzles.

22. (Original) The method according to claim 21 including the step of cleaning the captured ink.

23. (Original) The method according to claim 22 including the step of recharging the pen with cleaned ink.

24. (Original) The method according to claim 6 including the step of moving the pen into fluid communication with an ink supply and wherein the pump causes ink to flow into the ink chamber.

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25. (Original) The method according to claim 24 where the pen includes nozzles and wherein ink flows into the ink chamber through the nozzles.

26. (Currently Amended) A pen maintenance apparatus, comprising:
a pen having a printhead, an ink reservoir and sensor that detects the amount of ink in the reservoir, said pen mounted in a hardcopy device;
an ink supply in the hardcopy device that supplies ink to the reservoir; and
a pump in the hardcopy device for modifying ~~a~~ the pressure in the reservoir while the pen is in the hardcopy device to selectively expel ink from the reservoir through the printhead and to cause ink to enter the reservoir through the printhead.

27. (Original) The pen maintenance apparatus according to claim 26 wherein the pen includes nozzles, and wherein operation of the pump decreases the pressure in the reservoir to cause ink to flow from the ink supply through the nozzles and into the reservoir.

28. (Original) The pen maintenance apparatus according to claim 26 wherein the pen includes nozzles, and wherein operation of the pump increases the pressure in the reservoir to cause ink to flow through the nozzles and out of the reservoir.

29. (Currently Amended) A pen maintenance system, comprising:
a pen having a printhead and an ink chamber, said pen ~~pin~~ reciprocally movable along a shaft between a printing position and a maintenance position;
a sensor for monitoring the amount of ink in the ink chamber;
a controller for moving the pen to the maintenance position;
a pump fluidly coupled to the ink chamber when the pen is in the maintenance position;
an ink supply reservoir positioned adjacent the shaft and having a cap defining a seat configured to receive the printhead when the pen is in the maintenance position so as to define a seal between the printhead and the cap;

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wherein ink may selectively be expelled from the pen through the printhead and into the ink supply reservoir, and introduced to the pen from the ink supply through the printhead by operation of the pump.

30. (Original) The pen maintenance system according to claim 29 wherein the pen is selectively fluidly connectable to the ink supply reservoir and the pump is configured for altering the pressure in the ink chamber to either cause ink from the ink supply reservoir to flow into the ink chamber, or cause ink to flow from the ink chamber to the ink supply reservoir.

31. (Original) The pen maintenance system according to claim 29 including an actuator for selectively moving the pump into and out of fluid communication with the ink.

32. (Original) The pen maintenance system according to claim 31 including an actuator for selectively moving the ink supply reservoir into and out of fluid communication with the printhead.